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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOON GEE NEOH,
EN-TANG KANG, SOCK WEE NG,
and JEYAGOWRY T. SAMPANTHAR

Appeal 2008-2109
Application 09/895,153
Technology Center 1700

Decided: June 27, 2008

Before CHUNG K. PAK, CHARLES F. WARREN, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claim 36 in the Office Action mailed December 6, 2005. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2005).

We reverse the decision of the Primary Examiner.

Claim 36 illustrates Appellants' invention of a method for preparing an electrically conductive polymer material:

36. A method for preparing an electrically conductive polymeric material comprising:

a) providing a vinyl benzyl halide grafted film substrate;

b) reacting the vinyl benzyl halide grafted film with an equimolar mixture of 4,4' bipyridine and p-xylene dihalide to form a viologen salt-grafted film;

c) coating the viologen salt-grafted film with polyaniline to form a polyaniline-coated film; and

d) exposing the polyaniline-coated film to near-ultraviolet radiation to obtain an electrically conductive polymer.

The Examiner relies upon the evidence in these references (Ans. 3)[1]:

Williams	US 4,414,080	Jun. 9, 1983
Pohl	US 4,455,233	Jun. 19, 1984
Beratan	US 5,016,063	May 14, 1991
Sato	JP 56-26977 A	Mar. 16, 1981

Appellants rely on the evidence in these references (App. Br. [2] 6-7 and 10):

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[1] We have not considered the United States Patent "considered pertinent" by the Examiner which is not included in the statement of the ground of rejection. Ans. 8. Reliance on this evidence is improper. *See In re Hoch*, 428 F.2d 1341, 1342 n. 3 (CCPA 1970); *cf. Ex parte Raske*, 28 USPQ2d 1304, 1304-05 (BPAI 1993).

[2] We have considered only the Appeal Brief filed December 29, 2006, the Answer entered June 7, 2007, and the Reply Brief filed September 26, 2006. In view of the fact the three Answers of record are the same because they do not differ in substantive content, we have not considered the Reply Briefs filed June 5, 2007, and August 6, 2007, both of which differ substantively from the first Reply Brief. In this respect, 37 C.F.R. §§ 41.41 and 41.43 respectively limit Appellants to one reply brief for an answer and to one reply brief for a supplemental answer furnished in response to a reply brief.

Kamogawa and Ono, "Redox photochromism in films of viologens and related compounds bearing long-chain alkyl groups," 3 *Chem. Mater.*, 1020-23 (1991).

Ogawa. Nishikawa, Nishimoto, and Kagiya, "Poly(vinyl alcohol) film containing methyl viologen as a highly sensitive dosimeter," *Radiat. Phys. Chem.,* Vol. 29, No. 5, 353-57 (1987).

Sampanthar, Neoh, Ng, Kang, and Tan, "Flexible smart window via surface graft copolymerization of viologen on polyethylene," 12 *Advanced Materials*, 1536-39 (2000).

Appellants request review of the ground of rejection under 35 U.S.C. § 103(a) (App. Br. 3): claim 36 over Sato in view of Pohl, Williams, and Beratan. Ans. 4.

The Examiner has identified four differences between the claimed method encompassed by claim 36 and the method disclosed by Sato. Ans. 4-5. The threshold issue involves the fourth difference wherein the claimed method requires coating the viologen salt-grafted film prepared in the previous steps with a polyaniline film, and Sato discloses coating a viologen-salt containing substrate with a solid alcohol: whether one of ordinary skill in this art would have prima facie found in Beratan the suggestion to modify Sato's process by substituting a polyaniline film for the solid alcohol film used therein.

The Examiner contends, among other things, that Beratan would have taught "that polyaniline is suitable for the use as electron donor for viologen salt acceptor," and thus, it would have been obvious "to have used polyaniline as a donor in Sato." Ans. 6-7, citing Beratan col. 6, ll. 16-30; *see also* Ans. 9-11. The Examiner further finds that "[i]n [Beratan] FIG. 4b, ruthenium tris(2,2'-bipyridine) is the intermediate, dimethyl aniline is the donor, and methyl viologen is the acceptor (See column 6, lines 16-26)," and

that "[a]s could be seen at FIG. 4b, the methyl viologen acceptor is covalently attached to a film substrate having grafted benzyl groups C_6H_5-CH_2-." Ans. 8 (emphasis omitted). The Examiner finds that Beratan does "not disclose how the methyl viologen acceptor is covalently attached to a film substrate having grafted benzyl groups C_6H_5-CH_2- . . . [but] [i]t could be assumed, therefore, that customary methods have been used." Ans. 8 (emphasis omitted).

Appellants contend, among other things, that "Beratan does not make any conductive material comprising polyaniline . . . [as it] shows redox cycling between aniline and viologen monomer units in a polymer using a ruthenium bipyridine intermediate." App. Br. 6, quoting the Amendment filed October 13, 2005 at 8-9 (emphasis omitted). Thus, Appellants argue "Beratan in fact describes a material that is a co-polymer of aniline and viologen, not an article comprising polyaniline and viologen." App. Br. 6; *see also* Reply Br. 2-3.

We find Beratan discloses a polymer chain made up of a plurality of monomeric repeat units in the functional order of donor, intermediate, and acceptor monomeric units, and uses the polymer as a chain and not in film form. Beratan , e.g., col. 2, ll. 3-16, col. 4, ll. 16-48, col. 7, ll. 33-63, and Figs. 2a and 7. Beratan Figure 4b illustrates a single methyl viologen monomeric acceptor unit bonded to a single ruthenium containing monomeric intermediate unit which, in turn, is bonded to a single dimethyl aniline monomeric donor unit, with the three monomer unit molecular system repeating in the polymer chain. Beratan, e.g., col. 3, ll. 15-16, col. 4, ll. 65-67, and col. 6, ll. 16-30.

Appellants acknowledge that polyaniline films on substrates are known in the art. Spec., e.g. 1. We notice that in a polyaniline chain, the interior amino nitrogens are each directly bonded to two phenyl rings.

On this record, we agree with Appellants that the part of Beratan relied on by the Examiner would not have disclosed or suggested the employment of a polyaniline film as claimed to one of ordinary skill in this art. Indeed, there is no evidence in the reference of a polyaniline chain. Thus, the Examiner has not established either by scientific explanation or evidence that, prima facie, one of ordinary skill in this art following the combined teachings of Beratan and the other applied references would have formed a polyaniline film on a viologen containing material, including the viologen salt-grafted film as claimed. *See, e.g., KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007) ("it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does"); *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998) ("hindsight" is inferred when the specific understanding or principal within the knowledge of one of ordinary skill in the art leading to the modification of the prior art in order to arrive at appellant's claimed invention has not been explained); *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." (citations

omitted)); *In re Warner*, 379 F.2d 1011, 1016 (CCPA 1967) ("Thus, where the invention sought to be patented resides in a combination of old elements, the proper inquiry is whether *bringing them together was obvious* and not, whether one of ordinary skill having the invention before him, would find it obvious through hindsight to construct the invention from elements of the prior art."); *cf. Ex parte Levengood*, 28 USPQ2d 1300, 1301-02 (BPAI 1993), citing *Ex parte Gerlach*, 212 USPQ 471 (Bd. App. 1980) ("At best, the examiner's comments regarding obviousness amount to an assertion that one of ordinary skill in the relevant art would have been able to arrive at appellant's invention because he had the necessary skills to carry out the requisite process steps. This is an inappropriate standard for obviousness. . . . That which is within the capabilities of one skilled in the art is not synonymous with obviousness.").

Accordingly, in the absence of a prima facie case of obviousness, we reverse the ground of rejection of claim 36 under 35 U.S.C. § 103(a).

The Primary Examiner's decision is reversed.

REVERSED

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